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ABSTRACT

To help determine the future of the Bibliographic Service Development Program (BSDP), the Council on Library Resources (CLR) sponsored a conference to examine bibliographic services for library users with emphasis on their needs. The 32 participants included invited speakers, research library administrators, foundation officers, network and computing center administrators, library/communications school faculty, CLR board members, CLR staff, and BSDP Program Committee members. Four challenge or discussion papers were given at the conference: "The Academic Community and Bibliographic Services," by Thomas H. Martin; "Bibliographic Access: Problems and Prospects," by Douglas Ferguson; "Integrated Academic Information Systems: The Bibliographic Interface," by Nina W. Matheson; and "The Knowledge Business: Economic Issues of Access to Bibliographic Information," by Carlton Rochell. Four working groups, following the themes of the papers, met later to discuss the issues. Their collective recommendations were refined by the entire group into a set of priorities for Council action. This report consists of the recommendations of the conference, the four discussion group reports, the four formal papers, a background paper ("Five Years of the Bibliographic Service Development Program: 1979-1983," by C. Lee Jones), and opening session summaries. It also includes the agenda of the meeting, the set of challenge questions prepared beforehand, and a list of participants. (Author/DMC)

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# BIBLIOGRAPHIC SERVICES
# AND USER NEEDS

Report of a conference sponsored by
The Council on Library Resources

held at

Linda Hall Library
Kansas City, Missouri

December 14-16, 1983

Compiled and edited by

Paul Peterson

Bibliographic Service Development Program

Council on Library Resources, Inc.
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March 1984

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# SUMMARY

To help determine the future of the Bibliographic Service Development Program (BSDP), the Council on Library Resources sponsored a conference to examine bibliographic services for library users with emphasis on their needs. The meeting was held at Linda Hall Library in Kansas City, Missouri, on December 14-16, 1983.

The 32 participants included invited speakers, research library administrators, foundation officers, network and computing center administrators, library/communications school faculty, CLR board members, BSDP Program Committee members, and CLR staff. The conference thus brought together people representing a wide range of services and users--and 32 different perspectives on how bibliographic services ought to be improved.

The purpose of "Bibliographic Services and User Needs" was to identify directions toward which the BSDP should move in the near future. To provide background before the meeting, the Council distributed a paper describing the history of the BSDP and a list of issues, designed to stimulate thought on the future of the program. The opening session was devoted to bringing the group up to date on BSDP-related activities of CLR, the shared cataloging services--WLN, RLG, OCLC--and the Library of Congress.

Four challenge or discussion papers were given at the conference; four working groups, following the themes of the papers, met later to discuss the issues. Their collective recommendations were refined by the entire group into a set of priorities for Council action.

This report consists of the recommendations of the conference, the four discussion group reports, the four formal papers, the background paper, and opening session summaries. It also includes the agenda of the meeting, the set of challenge questions prepared beforehand, and a list of participants.

# PREFACE

The extension and automation of the nation's bibliographic systems have been the most complex and, it will be finally judged, the most cohesive undertaking in library history. The work is not done by any means, but there is a better understanding of the importance of this effort to a society that is increasingly dependent on information, and the organizational structures and skills required for further progress are largely in place.

National libraries, the pioneering bibliographic networks, many research libraries and hundreds of individuals have taken part in the work thus far. The need for productive communication among these participants and, on occasion, for financial and organizational support was a clear requirement from the start. The Bibliographic Service Development Program was established to fill that need and the record of activity during the five years since 1979 provides the evidence that validates the effort.

But, as we noted, there is much still to be done. The emphasis thus far has been on improving the operating performance of libraries and establishing the national and international base for bibliographic development. It is now possible to build on these new capabilities and to turn our attention to the needs of individual users. The work ahead is intellectually demanding. It is necessary to probe deeply into the relationships between the characteristics of recorded information and the specific requirements of individuals working in all disciplines and at all levels. As the sheer quantity and diversity of recorded information grows, improved precision in bibliographic systems is essential.

This present report on user needs, one in a series of BSDP publications, suggests future program directions as seen by those who participated in a meeting in December 1983. As usual, CLR is grateful to the participants who took time to prepare papers and to talk with us. The record of CLR's past work should, by now, assure those who help that we really listen. Our future activities will help reinforce that fact.

Warren J. Haas

# I. INTRODUCTION

When the Council on Library Resources began its Bibliographic Service Development Program (BSDP) in 1979, it estimated that the program's objectives would be met in five years. For a variety of reasons that time frame has been extended by at least two years.

The record of the program has been outlined in "Five Years of the Bibliographic Service Development Program: 1979-1983," which is reprinted as Appendix A of this report.

To help determine what the BSDP should concentrate on in the near future, the Council invited a group of experts to a conference whose very title describes the pervasive theme of the BSDP: "Bibliographic Services and User Needs."

The participants represented virtually all groups affecting, or affected by, bibliographic services in the United States: people representing academic and research libraries, national shared cataloging organizations, schools of library science and communications, foundations, network and computing centers, and CLR staff and BSDP Program Committee members. A list of the participants is included as Appendix D.

## Background Information

As a prologue to the meeting, the Council distributed a memorandum to each participant, including the aforementioned BSDP historical paper and a comprehensive list of BSDP projects, grants and contracts, and publications through 1983.

Also included was a list of questions or issues to be used as a guide for the discussions during the conference:

- How useful would it be to have access to different kinds of bibliographic data (monographs and journal citations) from a common terminal?
- Can searching the online catalog be simplified? How?
- Is the search for affordable improvements in subject access worthwhile?
- What are the problems of integrating the online catalog into the "wired campus"?
- Are students and scholars well served by the present bibliographic structure?
- Are there products or services that should or ought to be developed from existing bibliographic databases?
- What are the barriers to unimpeded access to bibliographic records? How can they be breached?
- What will the bibliographic requirements be at the turn of the century? Is the present record structure adequate?
- What are the short-term needs of users as they relate to records and systems? Are their longer-term needs different?
- How will institutions deal with increased costs for additional bibliographic services (people, equipment, telecommunications, etc.)?
- What will the impact on service be of the dispersion of online catalog access points to all terminals capable of communicating with the online catalog computer? What will the user training problems be? How will the library deal with access problems experienced by remote users?
- What is the most effective role that the BSDP can play in dealing with these issues?

## The Opening Session

Challenged by the call to help shape the future of the BSDP (and challenged further by a heavy snowstorm falling on Kansas City), the group met first on Wednesday evening, December 14, 1983.

After welcoming and introducing the participants, conference moderator Lee Jones outlined the procedures of the conference and stated its aim: "To arrive at an agenda appropriate not only for the Council's Bibliographic Service Development Program, but for all of us in this room and for all of the institutions represented here."

He then characterized the "four institutions which have labored mightily, though not necessarily cooperatively, in the bibliographic vineyard:" WLN, RLG, OCLC, and the Library of Congress. To focus on the bibliographic situation today, he asked the next four speakers to summarize the activities of their organizations during the past five years and describe current programs.

Roderick Swartz of WLN reminded the group that WLN was still on the drawing board six years ago, but has grown rapidly to over 120 members. Today, he said, WLN is strengthening its planning and development division and its telecommunications division, and is actively developing its marketing potential. He stated that WLN is working cooperatively with its colleagues, especially RLG and LC.

Richard McCoy of RLG traced the organization's history and cited several statistics, including RLG's 14.5 million records and $12.9 million balanced budget today. Major current programs, he said, are in resource sharing, collection development, and preservation, combined with the technical support for all three. He pointed to RLG's cooperation with ARL on the collection inventory conspectus and to RLG's work with WLN and LC on the forthcoming cooperative exchange of records. McCoy depicted 1983-84 as a period of stability for RLG and a time of cooperative programs among its 28 member/owners and 24 other members.

Rowland Brown of OCLC related the historical developments that led to its current size: 10 million records, 180 million holdings records, a staff of 700, and 4,800 members. He said that OCLC's change from a cooperative into OCLC, Inc. altered the governance structure to allow more responsiveness to user needs. He stated that patron access will be enhanced by subject searching next year, and pointed out OCLC's newer objectives, including the move toward support of a microcomputer-based system, allowing users to be more time-independent of the system.

Henriette Avram of the Library of Congress Processing Division pointed to the long-time conflicts at LC: between automating for LC or for the national community, and, within LC, between the total systems approach and the modular approach. "The Library of Congress," she stated, "has always been involved with cooperative projects, but automation today gives them greater potential than ever."

Avram indicated as examples the LC involvement with RLG's Chinese/-Japanese/Korean Project and the Name Authority Cooperative Project--there are over 1 million authority records at LC--but reminded the group that "LC is not out to be a bibliographic utility--we must cooperate with other libraries."

To that end, LC has begun negotiations with OCLC, RLIN, and WLN to accept their records in machine-readable form. The NUC is the only vehicle in which all three utilities' records are brought together in one place, she said.

## The Linked Systems Project

All four speakers touched on one of the conference's underlying themes: the linking of the national databases, specifically through the BSDP's Linked Systems Project (LSP). Swartz said that WLN supported the LSP and intended to continue to work with the larger nationwide community. He also saw regional potentials in the project.

McCoy spoke of the potential to provide links between networks and local integrated library systems. The LSP, he said, is an "opportunity to create logically a national network of library bibliographic resources, and to encourage open sharing of records across a variety of networks and among all libraries."

Brown said that OCLC did "recognize that our system must be able to link with almost any other machine and system," but wondered what the standards of such links should be: LSP protocols or those of some other system. He stressed that "our system must be able to adapt to changes in the telecommunications system."

Avram called the LSP the most significant major activity of the last five years. "There is being developed a standard for LSP linkage," she maintained.

Lee Jones summarized the evening's activities as having established where we are today relative to bibliographic services. The remainder of the conference, he said, would be devoted to where we should go from here.

## The Second Day: Presentation and Analysis

The Thursday morning session featured four challenge papers:

"The Academic Community and Bibliographic Services," by Thomas Martin

"Bibliographic Access: Problems and Prospects," by Douglas Ferguson

"Integrated Academic Information Systems: The Bibliographic Interface," by Nina Matheson

"The Knowledge Business: Economic Issues of Access to Bibliographic Information," by Carlton Rochell.

These papers are presented as chapters II-V of this report.

Following lunch, the conference broke up into four groups, each led by one of the morning's speakers. The groups met all afternoon, working on the issues raised by the challenge papers and the list of questions provided earlier. Each group developed several recommendations for the next morning's session.

Thursday evening provided the opportunity for recreation with tours of Linda Hall Library, the independent research library of science and technology which served as the host location for the conference.

Following dinner, Dr. William B. Ashworth, the library's consultant for the history of science, presented a slide discussion on "Images of Baroque Science." By showing how illustrated title pages of 17th- and 18th-century rare books contained allegories of scientific controversies, he traced changing perceptions of the world.

## The Third Day: Synthesis

The group reassembled early on Friday to discuss its own perceptions of the bibliographic world. The full group heard the recommendations of the working sessions, which are included as chapter VI of this report.

At this point the conference was ready to focus its attention on sifting through the most important recommendations and ranking them. The resulting list of BSDP priorities, the product of the group's consensus, is the essence of the conference. It is presented as chapter VII of this report.

By Friday afternoon the meeting was adjourned, with one important exception: the BSDP Program Committee met to decide what immediate steps to take on the conference's recommendations.

Thus the Council moved to transform the collective thoughts of a diverse group of people into action aimed at eliminating the gap between bibliographic services and user needs--and to work to fulfill the goals of the Bibliographic Service Development Program in the near future.

## II. THE ACADEMIC COMMUNITY AND BIBLIOGRAPHIC SERVICES

Thomas H. Martin, Syracuse University

One of the things I need to tell you right away is that I speak as a library user rather than as a librarian. My background is in mathematics, law, computer science, and communication. I am coordinator of a masters program in Information Resources Management at Syracuse, but I don't have any formal training in library science and have never worked in a library. My approach is that of a searcher wanting to make sure libraries continue to serve faculty and student needs.

In thinking about the future of libraries, one must consider both constancies and changes. First let us consider constancies. Part of my training in communication is in how people use and are stimulated by media. The library is one of those media, and people's reactions are often to the medium itself rather than to the content. Even before using academic libraries the first time, people have feelings and expectations about what happens in a library--the pleasure of discovering that somebody is writing about things you are interested in, the excitement of finding in a few minutes that the world's knowledge can be at your fingertips, or the relaxation of sitting down and thumbing through a magazine. People come to libraries expecting that experiences will be like they were before, and I think that most academics hope that this will continue.

The studies of how people use libraries suggest that media habits are regular and only change gradually over the years. Library users tend to be extremely active and literate people. I do not know of specific studies of academic library users, but public library use tends to taper off as people get older. This may be due to physical mobility difficulties, feelings that one is already tied into the proper information networks, or perhaps an unwillingness to start right from the beginning again. For young users who still are open and active, library use may be one of the ways of gaining access to new fields of knowledge.

From my reading of the literature, most people tend to be very satisfied with libraries. Perhaps those who do not get satisfaction out of libraries stop using them before they get to college. However, some of the satisfaction may come from how people tend to use information.

Information use is much better described by a stimulation model than by a seeking model. People are more likely to bump into things they didn't know were there than intentionally look for things they already know about. Through their habits of going through the stacks, how they thumb through the catalog, they run into things even though they can't tell you exactly what they were looking for.

The other side of this is that they are very often unaware of all the things they could have found but didn't. Studies of how people are using online search systems show a tremendous satisfaction with very poor recall. The consequence is that people may be blissfully ignorant. I think the people who very often become the most dissatisfied are those who move from one library to another and suddenly find that things that were available in the first library are not available in the second. You find dissatisfaction in the early days there, but as time passes they get used to the new library and revert to satisfaction.

Now, I don't want to sound like I don't know what is going on, because I know that library staffs are constantly encountering frustrated people. These are the people who in fact are searching for something that isn't there. It may be something that hasn't been ordered by the library, that has been checked out by someone else, or that may not be in the proper location on the shelves. Then they are aware of barriers and often overgeneralize, claiming that "nothing is ever in the library when I want it."

These are just a few of the "constancies" that people experience in libraries--browsing, being surprised, gaining access, reading, noticing absences, or perhaps enjoying the building.

Now let us turn to changes. We are in a very unusual period in history. I suppose it doesn't need to be said, but resources, especially in the United States, are getting scarce. We are also experiencing a fantastic increase in demand for computing. I happen to be chairman of the Computing Resources Committee for the University Senate at Syracuse, and we are trying to figure out how to quadruple the amount of money going toward computing over the next ten years. Even if we can do that, we expect that the quality of service will be degraded because so much demand will be unmet.

Universities are faced with the demographic fact that the Zero Population Growth people were successful. There are not a lot of new bodies who are going to be paying tuition. There are also a lot of middle-aged faculty who have tenure and will be expecting salary increases. The consequence of these trends is that resources are very tight, and that academic planners have to figure out who is going to be cut back. I am afraid that if we just keep pointing out how satisfied library users are and do not organize an articulate support group that will fight, library budgets will continue to be cut. Librarians must become active and adopt a number of strategies.

One strategy I would like to recommend is distinctiveness, or making people aware that there are new and exciting things happening in academic libraries. One of the ways this is being done right now is the excitement generated by online public access catalogs. At Syracuse we have an OPAC called SULIRS (Syracuse University's Library Information Retrieval System). I am constantly surprised that students are taking their turn at the terminals and get so much enjoyment playing with them, and in the process find things that they hadn't realized were there. They actually go to the stacks and look for some of the things that they find.

I had a colleague from another university who came to Syracuse to be interviewed for a job in another department. He said that everywhere he went he kept hearing about SULIRS, so I took him over to the library and showed it to him. One of my areas is human interaction with computers, and I am very dubious about claims that people can go up to terminals and use the system without much training. Rather than giving a demonstration, I asked him to see if he could use it and I would watch. Fortunately the SULIRS staff and I had been working for some months to be sure people could do this, so that in a period of two minutes he had entered a query that worked--politics of computers. I was worried that it might not, because the system does not drop off "s" and I knew that this was not in any Library of Congress subject heading. I did suggest that he use a different search command than subject, but this was the only coaching. Out came six different citations, of which he knew four. He was tremendously impressed, and left with a very positive image of the library. He went back to a university without an online catalog and may now have a new dissatisfaction. This is just one of the distinctive and exciting uses of the online catalog.

One of the ways I think we should use online catalogs is as retrieval support systems. People are now becoming accustomed to going up to the terminals and using their hands to type messages into the system. Why can't this volunteered information be used to find out what people want or expect to find in the library? How can the system help them decide whether or not it is worthwhile to continue on into the stacks?

One of the things that needs to be there in the terminal display is whether or not the book will be on the shelf. It should show whether the book is on reserve for a course, whether or not it is checked out and when it will be returned, or if it has been ordered by the library but is still in process. We ought to go to the next step and let them ask for interlibrary loan, put a hold on the book, or perhaps point out that a book should be ordered, provided that sufficient identifying information is entered by the user. Perhaps the user should be able to pinpoint particular items that look interesting so he can get a printout to carry to the stacks. If all this is done right, the library staff will have a rich source of information about the books in which library users show an interest. Perhaps this information will be of more use to acquisitions than what is available through the record of what is checked out. Another idea for the catalog as a retrieval support system is that users might appreciate getting some sort of feeling about how frequently particular books circulate. People are often interested in finding out what other library users are checking out. These are just a few of many possible ways that the online catalog can facilitate communication between users and library staff.

I do not want to give the impression that everything will be better if only computers are used. I was involved in the design of SPIRES at Stanford and was involved in early discussions between designers of many systems about how interactive search systems would lead to users doing their own searching. Searching turned out to be challenging, and a whole new professional--the intermediary--emerged to simplify searching for end users.

Christine Borgman has just completed her dissertation at Stanford, taking Stanford students and trying to get them to use Boolean logic to formulate queries. They tended not to do very well; even students who had taken courses in logic had difficulties. The people who had the hardest time tended to come from the arts and humanities--that is, the heaviest users of libraries. Consider carefully: what are we doing if the most loyal of library users find the online catalog to be a hindrance blocking their use of libraries? I think that we have a long way to go in simplifying interfaces, and am quite sure we can do much better than trying to teach everybody Boolean logic. We cannot "solve" the Boolean difficulty by leaving out any logical capability, as some designers have. There has to be some way to elaborate upon a query and/or to make it more restrictive.

For example, in studies I have been conducting at Syracuse regarding the types of queries people enter into the system, there is a tendency for users to get too little or too much. If they use the command TI they try to type in a whole title. This usually retrieves nothing because generally at least one word in what they enter is wrong. With implicit "and"ing a single wrong word results in zero items retrieved. If they use the command WD they tend to enter a single word. Generally they get back 200 items retrieved--the maximum a user can see at one time--and they become lost because they do not know how to refine the query.

The online catalog being developed at Bell Laboratories (by Syracuse graduates) lets the user enter as many terms as he wants to, and then rank orders the results on the basis of how many of the words match words in the title or subject fields of the bibliographic citations. In this way users are not penalized for using many terms and can look at a few citations that have a high probability of being useful.

I am sure our users would very much like to have the capability available at Bell Laboratories, but they do not know about it. Our guess is that only about 30 to 40 percent of the time are our users getting what they want, but when we ask them about things, they say things are fantastic, terrific. How can they get so excited about a system that they can't use very well? I don't know. They are very satisfied and have high expectations. I don't think their high expectations will be satisfied if we don't continue on and make sure that they can easily locate a number of relevant citations.

It is not at all uncommon for information systems to be designed in ways that are not user-friendly. At a recent conference in Boston on Human Factors in Computing Systems sponsored by the ACM, a number of us who try to promote user friendly systems expressed our frustration. John Gould of IBM started his talk with four design principles: 1) determine who the users are and what they are like, 2) involve representative users in design formulation, 3) use a prototype or simulation so the representative users can actually try out the system, and 4) modify the system until they can comfortably do their tasks. He then went on to find out how many designers actually do any of these things. He asked designers to write out the steps they followed in design and, out of 447 designers, about 40 percent included two or more of these four steps. There is a very deep belief that designers have in their ability to do things properly, and they think that involving users will just mess things up. Designers tend to underestimate the diversity of users, and the consequence is that we are getting systems that the designers can use, but that many other users cannot. There is a fear among system developers that iterative design will extend things too long, but if people can't use a system there is a continuing cost. The history of online systems has been that design has had to continue many years longer than initially planned. If we have learned anything, it is that designing computer systems so people can use them easily is very difficult. It requires an iterative design process where ideas are put into prototypes, tested out by representative users, and revisions are made. It takes years to do it properly. The idea that one can just put a system together and have people use it from the beginning is a very bad myth, and I hope we are not going to make that mistake with online catalogs.

Consider another change in the library's situation where it can show its distinctiveness. We are entering into a very high technology period of history, and one of the things that happens in extreme periods is an attempt at counterbalancing. Naisbitt suggests in Megatrends that high tech is being counterbalanced by "high touch." There are a number of us who feel that methods for keeping people in contact with other people need to be improved. The computer may be isolating and differentiating people too much from each other. One way to pull people together is to have them share in a common center. The library has always been a place where knowledge has been shared, and in a very real sense is a commons. There are many ways in which this can be made even more true. If you look at how people use information, they may start with the printed word, but they very often go next to people they know. As they are entering their terms into the online catalog, they might not only receive bibliographic citations, but also names of courses, professors, other members of the community who are interested in the topic, and groups where they can find out more about the topic. I am not suggesting that we immediately go out and implement all of these suggestions, but we need to find out to what extent people would like to expand their searches to locate human as well as printed sources.

When I was a student at Stanford, they were putting together profiles of those faculty who wanted to have others know what their interests were. People could then get on SPIRES and search for people doing what they were interested in. One of the things I liked very much at Stanford was an old circulation system in the Computer Science library of having cards in the backs of books showing who had recently checked them out. I liked that because I could go in and find out who was interested in things I was interested in. One of the things that really bothers me is when there is a book I want that is checked out to another person. I would like to know who it is so I could go talk to him so we could resolve who had the greater need.

I would like to see how many people would be willing to have their names revealed and how many would not. This is likely to be a hard area to get people cooperating.

Another side of pulling people together is through aggregation. One of the values that I get out of libraries is that I can sense where there is activity in a new area. I look at the books on the shelf--if there are a whole bunch of new ones, and, upon opening them to the back, I find out that they are being checked out, I know something is going on. I do the same thing in book stores, often buying the books that other professors have ordered for their students. I look at the reserve lists to see what books they consider sufficiently important to have their students read. I go through course catalogs to see what new courses are being offered and who is teaching them. I am learning about my colleagues in this way. It is possible to set up libraries and online catalogs so that one can discover where there is activity and new growth. This is Vannevar Bush's Memex concept, revealing the intellectual footprints of one's predecessors.

In conclusion, we have gone over some of the constancies and changes that make libraries enjoyable and offer opportunities for distinctiveness. Some ways that online public access catalogs can be used are as communication devices for connecting users to staff, and as support systems for helping users find out where things are located and for staff to find out where there is need for change. The online catalog can also be used to help pull people together, and can show where fields are growing and who are the people to get in touch with to find out more. The library, through the online catalog, has the opportunity to expand and become the commons of the wired campus of tomorrow.

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## III. BIBLIOGRAPHIC ACCESS: PROBLEMS AND PROSPECTS

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### Introduction

The problems and prospects for bibliographic access are important to each of us, and I appreciate the Council's invitation to summarize to this distinguished group much of what you already know. The career of virtually everyone in this room spans the era in which computers, and the changes associated with them, have become part of the everyday services of libraries throughout the nation.

The "Progress" that was left out of my assigned title is due in large measure to the leadership provided by the group of people gathered in this room. Much of that progress has already been summarized by the chief executives of the utilities and by others who spoke last night. It is that progress that gives us confidence in moving forward, individually as well as collectively, and it is the mission of libraries as "knowledge institutions," in Daniel Boorstin's phrase, that impels us to review and renew our agenda as we move.

The context of my remarks is the context of research library service, but that happens to be a limitation of my own background and I would not want my remarks to be interpreted in an exclusive or narrow sense. The direction of my remarks is to identify what it is that we can do together to make that service more responsive to those whose research, scholarship, education, and creativity it supports. The responsibility of libraries, not only research libraries, is to make available the resource of recorded public knowledge to those who use it. The responsibility of each "generation" of librarians is to seek better ways of making the knowledge resource a useful element in the evolution of knowledge so that all of society may be enriched.

## Bibliographic Records and the Stewardship of Knowledge

I have been asked to address the structural problems that are characteristic of the bibliographic record systems that have evolved over the past twenty years in a pervasively electronic environment. After I had accepted this invitation and after seeing the charges of each speaker, one reaction I had was mild despair: What more can be said that hasn't been said before? The very phrase "bibliographic records" is cumbersome and suggests the worst in the neologisms of library science, management science, information science and computer science.

It seemed at the time that it would be vastly more enjoyable to discuss the patterns and processes of information use and what they imply for designing user-oriented information systems. The joy that comes from examining modes of information delivery and proposing innovative alternatives and extensions excites the imagination. Even economic issues have an immediate fascination, if only because we can identify with our own fluctuating bank balances and the gaps between our resources and our ambitions.

But I didn't call one of my fellow speakers and ask to swap topics, not just because that's impolite, but because then I would have to face the problems of their topics. It's a connected set of topics that we are talking about and the order is significant. For better or worse our bibliographic record systems flow from the creations of the researchers and writers who grow the knowledge resource and return to it with the hot breath of hope.

Our delivery systems work with the raw material of the records we create and the knowledge to which they point. Our economic resources and the policies and priorities surrounding them fuel our plans for change and control the pace and direction of that change. So I welcome the opportunity to join with you in examining both the problems of, and the prospects for, the production and distribution of bibliographic records. I've come to Kansas City to enjoy this meeting, integrated online bibliographic record structures or not, and I hope you feel the same.

If, for a moment, we can detach ourselves from the current embodiment of bibliographic items in cards and digital records, in catalogs and computer files, we can see them for a moment as a singular social invention. Bibliographic records and the conceptual connections between them are symbolic creations of the human mind that deal with the limits of human minds and seek to extend those limits. Very likely the earliest bibliographic record "systems" were inside people's heads. The monks who knew the manuscript collection by heart and the keepers of books in the royal and aristocratic libraries were walking bibliographic record systems. That's the way most of us, I suspect, still deal with our personal libraries.

But those human catalogs were part of a time when knowledge had a narrow scope, when the artifacts of knowledge were private possessions, and when few could either produce them, own them, or understand them. Bibliographic record systems emerged in that post-medieval period when nature became as important to decipher as nature's God; when the number of those who sought knowledge grew and when the technology for recording knowledge moved from a craft to a business.

It was during a period of two centuries or more that a new social vision grew in the minds of some, and endured. This is a vision that the stewardship of public recorded knowledge is an important social responsibility. It is important to the practical aims of society, to the education of the young, and to the uses and enlargement of knowledge itself.

What do bibliographic record systems have to do with the stewardship of public recorded knowledge? Very simply this: bibliographic record systems are the pathways of the mind through the store of public knowledge. We build those pathways as a public trust and as a professional responsibility. Where new pathways are needed they are created. Where pathways are outmoded they are renewed. Where pathways must meet other pathways those connections are made. The task is never ending and the system of paths is not unified nor should it be. A unified system of pathways is a dangerous thing.

The pathways of bibliographic records are there to enable us to care for the contents of the knowledge store. But the singularly important thing about the pathways is that they are there for those who use and create knowledge. Some roads must be suitable only for maintenance crews but few people want to spend much time traveling on Forestry Service roads.

To build better pathways it helps to understand something of the changing ways in which knowledge is created. To use the potentials of information technology in this task, it helps to understand some collective characteristics of information systems. And to see where we might build or rebuild next, it helps to take a look at what we have been doing in the recent past.

And that's what I want to do with you this morning: first, to look at the evolving character of research, not the whole picture, but some of it. Then, to examine some relevant features of information systems that are part of the knowledge environment. Third, to review what we have been doing to serve research by applying information technology, and then to identify some present limitations in our bibliographic record systems. Let's begin with some selected features of research in America today.

## The Evolving Character of the Research Enterprise

Research libraries are the single common resource and the single common creation of the research community. Virtually every scholar, writer, and researcher in every field of thought draws directly or indirectly on the knowledge resource, and each of these individuals adds to the continuing creation of that knowledge resource. Indeed, the research library is, at its best, only a reflection of that common research enterprise.

As research changes, the research library reflects and responds to those changes. There are several developments in the research that have particular meaning for libraries and especially libraries in higher education. Most problems in most disciplines require findings and perspectives from several disciplines. Few departments are without "By Courtesy" professors who teach and do research in other departments. Interdepartmental programs and seminars proliferate along with problem-focused research projects and multidisciplinary institutes. Research in the sciences, social sciences, and humanities is now typically interdisciplinary.

Second, academic research has national visibility and importance. The post-World War II development of government-university linkages has expanded to government-university-industrial linkages.[2] These partnerships often include groups whose members come from more than one university and from more than one industrial laboratory. Research communication and cooperation, research support, and the expectations of research make it in every sense a nationwide enterprise.

Third, significant research is now characteristic not just of a few but of many industrial nations. Programs of scholarly exchange, joint ventures among nations, and large numbers of international students at American universities are visible evidence of that. Research knowledge is international in character.

Fourth, research is no longer just the activity of the single scholar in the laboratory, office, or field setting. It is intertwined with graduate and often undergraduate education and is a part of the lengthening process of professional training.[3] The graduate student, the research associate, the post-doctoral fellow, and the adjunct professor are essential to today's research and they are often keys to the quality of tomorrow's discoveries.

Fifth, print on paper is no longer the sole medium for recording the results of research, and graphics are increasingly used to display and illustrate findings. Image, digital, video, and audio materials are growing in volume and importance. As preprints, technical reports, and conference papers have been integrated into the dissemination system as the initial and sometimes the final stages of recording knowledge, so now are computer-readable data files, software programs, video tapes, and audio tapes entering the stream, along with a variety of graphic material interspersed or associated with texts.

Finally, virtually every discipline is being affected by that multipurpose tool, the computer. Within the next decade the computer will be a permanent and essential fixture of the scholar's study, the scientist's laboratory, and the student's classroom. Some would say this has already happened.

## The Evolving Character of Research Information Systems

Research information systems have been evolving along with the character of research. The overall picture is one of growth and diversification that need not be recounted in detail for this audience. However, the national scene has a number of characteristics worth noting:

Information systems are developing in a pluralistic environment.

Information systems are expanding in territoriality.

Information systems are vigorously entrepreneurial.

Information systems are handling more of the knowledge chain.

Information systems and communication systems are one.

Information systems are focusing on the consumer or end user.

The pluralism of the American information scene is strikingly illustrated by the information map produced by the Harvard Program on Information Resources Policy.[4] It depicts a multitude of interest groups or "stakeholders" and a bewildering variety of producers and providers in the public sector, the private not-for-profit sector, and the private for-profit sector. The database segment is a small percentage of this map in terms of dollar volume and the library segment is a minuscule two percent of all information services and products sold.

Information systems have little sense of territoriality. For good and sufficient reasons even the most discipline-oriented systems, as in biology, and the most mission-oriented systems, as in education, overlap with other systems in content and audience.

The expanding and highly competitive information segment of the economy is vigorously entrepreneurial in identifying market needs and moving rapidly to meet them. New companies have produced new databases and new products based on those databases. Some are available only in computer-accessible form.

Computer processing, and therefore potential computer access, is moving backward from citations to abstracts to the original text. One publisher of microcomputer books in my hometown accepts manuscripts only in computer form, and the publisher supplies the computer.

While most information systems offer access by regular phone lines, many others offer access by one of the packet switching networks. With deregulation and the divestiture of the Bell System, more communication networks can be expected. A major database service last month announced that it will introduce its own communication network in 1984.

In the 1970s, when the public database segment was developing, the major market focus was on libraries. The 1980s have seen a significant shift to directing products, services, training, documentation, and pricing to researchers and other professional users in universities, corporations, and government organizations.

While it may appear that I have been describing developments only in the database service industry, each of these features has a counterpart in library information systems. Library information systems are pluralistic, overlapping, increasingly entrepreneurial, conscious of electronic publishing, focusing more resources on reliable communication systems, and developing access for the end user.

## The Evolving Character of Research Information Service

We have looked at some characteristics of the way research is conducted, and we have looked at some characteristics of the way research information systems are developing. How is the research library community interacting with the research context and with research information systems? The developments I intend to highlight are not all, or even the most important, developments. The cost-price spiral is clearly of immense significance, as are budget constraints and the necessity to seek more effective forms of managing human, physical, and collection resources. However, the following developments have particular significance for the production and distribution of bibliographic records:

Collection building pressures are diverse and unremitting.
Collection management is becoming necessarily collective.
Collection access is becoming more inter-institutional.
Union database services are growing in size and scope.
Local online catalogs are moving up on institutional agendas.

Local online catalogs are demonstrating clear benefits to users.

The research library community continues to strengthen the knowledge resource from what seems like an ever-growing stream of domestic and international material. Increasing attention is being paid to providing bibliographic control for material in digital, audio, and image formats. The work of OCLC in developing standards for cataloging software and the work of its Distinguished Visiting Scholar, Nancy Olson, is a significant initiative.

Faced with the fact that library purchasing power is at best static, while the demand for services and material is not, many libraries have turned to cooperative collection development. One example is the RLG online conspectus that provides a matrix of data assessing the subject-by-subject collection strength of member libraries.[5]

Research libraries draw from a widely distributed network of knowledge resources. The extended research library, embracing the contents of many research libraries, is becoming the essential analog of the extended research community. Scholars and researchers seek to interrogate and draw on the knowledge resources of several universities and governmental and corporate organizations. Direct interrogation and direct delivery contribute to productivity and achievement by saving time and enabling scholars to examine the knowledge resource in their own terms and ways. The Council is currently supporting one project to study the impact of end-user access to commercial databases through the library.

Two other well-known developments are making extended access and direct access a reality for researchers throughout the country. Libraries have poured the records of their holdings into gigantic union databases covering the holdings of many libraries. These databases are complete for some member institutions and represent the most recent decade of documents for most others. Terminals that can interrogate these databases stand alongside the librarian and the reference collection in hundreds of reference services where librarians use them to locate material in local and remote collections.

Drawing on a decade or more of database creation, libraries are creating local public online catalogs, sometimes by creating the database themselves, sometimes by drawing on records they have entered into union databases, and sometimes by a combination of the two approaches. Terminals are now in public areas, stack areas, and other locations convenient for library users. Many systems are part of a computing telecommunication network so the library's database can be searched from offices, laboratories, and dormitories and by dialup from homes and offices away from the university site.

The local online catalog is extending access across time as well as space. Service hours for computer systems are routinely seven days a week and around the clock, with scheduled downtime measured in just a few hours a week. The database is increasingly available when a problem emerges into awareness, rather than only when the university can afford to staff a library service point.

There is another aspect to the time dimension, in which time is saved by providing library users with availability status along with holding status. The advent of computer-based circulation systems as online catalogs, or in association with online catalogs, enables the researcher to go to the site where a copy is available or to seek alternate sources when it is not available in the local collection.

## Present Limitations of Bibliographic Record Systems

The benefits of the structure we have created for producing and distributing bibliographic records are well known. The structure is intended to serve the research and other information needs of the country by means of the information systems created by libraries and information organizations. The MARC formats and Distribution Service, the national and regional utilities, the regional and state service centers, and local online catalogs each have their limitations, but they are a permanent and vital part of the knowledge service structure of the nation.

With a decade or more of accomplishment behind us, we are in a position to see how that structure can be modified. Whether and how we want to proceed to make those modifications is a task we may begin at this meeting. I take it that our main task is to identify those activities that have enough mutual advantage to produce a consensus for action, and enough mutual risk that hardly any of us would undertake them alone. There seem to me to be at least five limitations of our bibliographic record systems that deserve continuing attention:

The unexploited possibilities of the MARC formats
The unexplored potential of electronic ordering
The self-contained operation of union databases
The isolation of local online catalogs
The sequestering of the MARC database from library users.

On several occasions I have heard Henriette Avram describe the MARC format(s) as a "container" in which libraries can put an enormous range of information. Various researchers have urged us to go beyond the title page in our online catalogs.[6]

What are the possibilities for including more content-descriptive information in our records? In working with machine-readable data files, for example, many librarians and researchers have found that information on the characteristics of a survey--its population and sampling frame, for example--are immensely helpful in selecting a data file for re-analysis.

In the recent CLR online catalog studies, 35 to 45 percent of respondents wanted more content information, the second most requested improvement in online catalogs.[7] The problems include labor costs of including additional information, the conflicts of including copyrighted information, and the concerns of publishers and authors that access to the record will substitute for use of the document. Such problems are not new to libraries and therefore perhaps we can take another look.

Electronic ordering services have been announced by several utilities, and the BISAC format hopefully reincarnated in Z39 format indicates that book vendors and utilities are ready to move.[8] Yet electronic book ordering seems basically at the level of electronic mail. One library is receiving MARC format approval records through its computer-based acquisition system, but that seems to be an exception. Amid the differing interests of book vendors, utilities, and libraries, what common interests and efforts will forge this link at the earliest stage in the bibliographic record chain?

The Linked Systems Project offers the potential for moving records between major computer systems by providing common data communications procedures.[9] The same procedures that allow moving records between utility computers can also be used to move records between libraries with their own processing systems (e.g., Penn State, Northwestern) and a utility computer. The initial focus of the project is on the exchange of authority data, but its potential is clear for the exchange of catalog records, holdings, and location data. The full costs are yet to be determined, but the benefits in terms of sharing the work of record creation and sharing access to several union databases argue for continued pursuit of computer-to-computer links between all the utilities.

As of today perhaps fewer than 10 percent of the country's libraries have online catalogs. There is every indication that this number will increase to a majority of libraries within a five- to ten-year period. Yet almost all of these online catalogs are isolated in both a horizontal and a vertical sense. They cannot communicate with nearby catalogs that are standalone catalogs or that are part of another utility. They cannot communicate with a union database in which their library participates. Thus we have the anomalous situation in which a researcher at a library terminal first searches the local database and, failing to find an item, has to get up and go to a reference desk where the librarian performs the same search on a union database system.

Finally, let's take another look at the MARC database. It is a daily resource for librarians creating bibliographic records. Reference librarians use it to identify a work that may not be in their library's catalog or in any catalog on the union database. There is a particular part of the MARC database that we might make available to our users. I'm referring to the Cataloging in Publication (CIP) records. The cataloging is often based on proof copies of publications and is available weeks before the book is in most catalogs. If our users had access to these records, they might just be able to recommend them for purchase or set up a preemptive interlibrary loan, assuming that cooperative arrangements for loaning recent in-print material exist. Books would get to our clientele faster and that clientele would, in turn, become more involved in creating the collections they use.

## Concluding Comments

I want to close with a few thoughts that don't seem to fit into any part of what has been said so far. Some of them may be pursued by our other speakers.

There is a bias in our information systems toward handling textual material. It's a bias we may not be able to sustain for long. Graphic material is important for disciplines as diverse as art history and city planning. A database vendor recently announced electronic delivery of full text, but illustrations are sent to the customer by mail. In 1981 a National Science Foundation study[10] admitted the importance of graphic material to scientific communication but cited massive storage requirements as a barrier. Optical disk systems are breaking through that barrier. But how will optical disk databases fit into our bibliographic record systems?

There is a thrust in our information systems planning toward putting more and more information in our databases. Retrospective conversion is the trend of the eighties. The result is massive databases and, in some cases, slower response time. How much is enough and for whom? Do we, as professionals, want a degree of database coverage that is suitable for only a small portion of our clientele a small portion of the time? Ithiel de Sola Pool, in a recent article on "Tracking the Flow of Information," cites "extraordinary rates of growth in the transmission of electronic information, but much lower rates of growth in the material that people actually consume, representing the phenomenon often labeled information overload."[11]

As we add more information in volume and variety to our information systems, the imperative for user-guided systems becomes stronger. Ought we to be thinking about the possibilities of "expert systems" for our online catalogs?[12] Expert systems offer the promise of making explicit the problem framework that searchers have difficulty articulating. If that ever happens, we will be at some kind of a breakthrough into a new dimension of interaction and access with our bibliographic record systems.

Finally, let's return to the theme of the growing knowledge base. One of the ways in which we can more effectively discharge our stewardship of the knowledge resource is by renewing our own commitment to applied research. Many significant studies conducted by OCLC's Research Department have benefited all who struggle with the problems of libraries today. The existence of several such units, especially in association with groups of libraries, would strengthen our ability to generate ideas, to study policy issues, to evaluate the feasibility and market viability of innovations, and to evaluate how we conduct our operations.

## Footnotes

[1] I want to acknowledge the opportunities for thinking beyond the present, offered by almost 15 years of work with automation and retrieval developments at Stanford University, extending from work on BALLOTS and SPIRES and subsequent work on the University Libraries Data Services Program, through projects at the Research Libraries Group, to the recent implementation of an online catalog, Socrates. The observations in this paper, however, are entirely my own.

[2] See for example Louis Robinson, "The University-Industrial Relationship," *Perspectives in Computing*, v3, no. 1 (March 1983): 4-13.

[3] Referring to Henry Taube, 1984 Nobel Laureate in Chemistry, *Science* (11/4/83, p. 489) reported "His ground-breaking work in the early 1950's on electron transfer between ions in solutions was based on ideas developed while preparing a lecture course at the University of Chicago, he said. 'I knew nothing about coordination chemistry, and what I knew bored me silly. I thought I should learn something about it and in preparing my lectures for the course, I became interested...My early work in Chicago was really based on what I learned in preparing for that course.'"

[4] For early versions of the Harvard map see Benjamin M. Compaine, "Shifting Boundaries in the Information Marketplace," in Carlton C. Rochell, ed., *An Information Agenda for the 1980s* (Chicago: American Library Association, 1981).

[5] Nancy E. Gwinn and Paul H. Mosher, "Coordinating Collection Development: The RLG Conspectus," *College and Research Libraries*, v44, no. 2 (March 1983): 128-39.

[6] Pauline Cochrane, "Improving the Quality of Information Retrieval-Online to a Library Catalog..." *Online*, v5, no. 3, July 1981.

[7] Joseph R. Matthews, et al., *Using Online Catalogs: A Nationwide Survey* (New York: Neal-Schuman, 1983).

[8] "BISAC Variable Format," *Information Technology and Libraries*, v2, no. 2 (June 1983): 191-210.

[9] Wayne Davison, "The WLN/RLG/LC Linked Systems Project" *Information Technology and Libraries*, v2, no. 1 (March 1983): 34-35.

[10] Forecasting International, *The Potential Influence of Social, Economic, Regulatory and Technological Factors on Scientific and Technical Communication Through 2000 AD.*, September 1, 1981, NTIS PB82-129917.

[11] Ithiel de Sola Pool, "Tracking the Flow of Information," *Science*, v221, no. 4611 (August 12, 1983): 609-13.

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[12] Richard O. Duda and Edward H. Shortliffe, "Expert Systems Research," Science, v220, no. 4594 (April 15, 1983): 261-66.

# IV. INTEGRATED ACADEMIC INFORMATION SYSTEMS: THE BIBLIOGRAPHIC INTERFACE

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Through its IAIMS initiative--the acronym IAIMS stands for Integrated Academic Information Management Systems--the NLM is sponsoring the development of several prototype systems that integrate library-managed information systems and the information structure of the academic medical center.

This is another NLM program likely to have far-reaching effects, for which Marty Cummings can take credit. It is a bold and somewhat risky step beyond the integration of files within a library or the linkage of databases between libraries. The IAIMS focus is on the institutional management of its information resources and the goal is to make the use of library databases integral to local institutional databases and networks.

The first phase of NLM support is institution-wide strategic planning to involve a broad spectrum of campus interests in the process of assessing institutional information resource requirements needed to support academic aims over the next decade. The emergent plans will be two-part. The first part will conceptualize how information databases may be used in the academic enterprise. The second part will consist of an operational plan for the development of a prototype IAIMS in which the library will play a central role.

The first IAIMS awards were made to the medical centers of Columbia University, Georgetown University, the University of Maryland, and the University of Utah. These are the first of an apparently growing number of major academic institutions where the senior management is beginning to recognize that information is the fourth major organizational resource that they must manage, along with people, facilities, and financial resources.

Even if the NLM program produces only some of the desired effects, we may see the beginning of a redefinition of the roles and purposes of health sciences libraries. Over the next few years, libraries are likely to experience enormous pressures to make rapid responses to new expectations for technologically sophisticated information delivery services, especially in science and medicine. To meet these demands on the resources and capabilities of libraries will require both new strategies and new resources. Both should flow from strategic planning.

Many institutions are developing campus-wide communications networks through which a multitude of databases and information processing needs can be met. These campus communications networks will first provide common services like word processing, electronic mail, and access to online library catalogs. This is the "wired campus."

They will begin to link various databases, making them accessible for different purposes. Later, some of these databases will serve to augment and modify larger databases. These integrated networks will ultimately become intelligent systems that support research, teaching, scholarship, services, and the management functions of the academic center.

There are no integrated systems of the kind envisioned, and it may take close to a decade to reach the point where the scholarly or academic record and working files can be melded. We have not more than a dozen years' experience to guide us in developing them. Little hard data is available, in part because of the speed of the revolving door of change.

Enough evidence is available, however, to suggest how the elective use of databases may change in the near term. As users gain experience with online databases, they will expect increasingly more intelligence, more extensive scope and coverage, more specificity and immediacy, and more supple systems. In the next few years I would expect campus information system users to make at least four demands from online library files:

1. They will expect online bibliographic files to provide access to the full resources of the library, not only the monographic titles, in a consistent fashion, and to depths beyond titles.
2. They will want online files that show relationships of library materials to the educational mission of the institution and that serve as a tool for both teaching and independent learning.
3. They will want online files that are intelligent and discriminating, or that at least assist the user to make intelligent discriminations as to the quality and value of a work the bibliographic data describes.
4. They will expect online files to extend every available resource to the user via communications channels rather than requiring the user to physically find information.

Each of these four expectations has serious implications for local library database management. Whether the modification of generic bibliographic records can assist local libraries to respond to the demand is unclear.

Let us examine each of these four expectations in a bit more detail.

First, "Online bibliographic files should provide access to the full resources of the library, not only the monographic records or the databases that the library owns or participates in."

Some health sciences libraries are beginning to respond to the need to expand bibliographic access to their resources. For example, the University of California system health sciences libraries are proposing that MEDLARS tapes become available as a part of MELVYL. The Georgetown Medical Center Library has developed MINI-MEDLINE. In MINI-MEDLINE the portion of the MEDLINE file that provides access to Georgetown's core journal collection is loaded into the local online catalog, allowing immediate unrestricted searching. They are also experimenting with the integration of a drug information database.

It is obvious that adding subsets of files like SUPERINDEX (the index to indexes of monographs published by 20 sci-tech publishers), BIOSIS, and various other science, education, and social science files would make a judiciously chosen collection a much more powerful resource. It may be that health sciences libraries can move more easily into bibliographic integration because of common indexing of both monograph and journal articles under MESH headings. Were academic libraries to move in this direction, considerable effort in subject heading development and reconciliation would be needed. The principal policy question might be phrased this way: Will it serve the institution's mission best to do a kind of intensive farming, that is, to provide multiple access points to a smaller group of information resources--an organizing principle of specialized libraries and information centers? If it is, the importation of selected databases must begin.

While the searching of online indexes was a novel use of technologies, the provision of service as a fee-for-service luxury may have been defensible. As online files take their place as fundamental access tools, replacing print versions, then uniting the monographic and serial indexing databases becomes an education policy issue, not a resource allocation issue. By continuing to make external databases available only to the more affluent, we not only support a two-track academic experience, but we seriously limit the library's database utility and effectively restrain access to the library's most current, most expensive, and most extensive portion of the collections.

The second expectation is for "Online files that show relationships of the library's materials to the educational mission of the institution, and that serve as a tool for both teaching and independent learning." A recent CLR study showed us that online bibliographic file users are looking for information, not for specific books by author or title. That need for information is likely to be related to a specific and immediate education- or work-related activity or process.

Libraries will need to add local information to their online databases if they are clearly to relate the collections to the academic mission. Such local information need not entail, necessarily, de novo data collection. For example, acquisitions decisions are normally made in response to criteria that could be added to the public files, containing such information as level of collection development, course relevance, faculty/staff recommendations, or objective review sources. Many course syllabi represent a distillation of information sources that could be keyed to the database.

In the longer run, library databases will be expected to support more independent or adult learning needs. The population in the near future will be predominantly adults. For this population, subject headings may be the basic intellectual access keys. The average number of topical subject headings for both CATLINE and MARC records is 1.8. Ten is the average number of headings in MEDLARS indexing. It may be that increasing the number of topical subject headings for monographic records may be useful.

On the other hand, we know that alphabetically-based indexing systems like LCSH are less effective than hierarchical subject headings like MESH for describing a field conceptually. When Peterson attempted to map LCSH Art and Architecture terms into a hierarchical structure, she found significant gaps and subject heading voids.

Lack of a disciplinary approach to subject analysis is likely to be a serious barrier to effective use of the bibliographic file. By providing a cognitive map of a field of study, bibliographic files could be used as self-educational tools, not only as finding devices for materials in libraries, on shelves, or on videodisks.

The third expectation is for "Online files that are intelligent and discriminating, or that at least assist the user to make intelligent discriminations as to the quality and value of the records retrieved." Subject-heading and keyword retrieval are a far cry from even primitive knowledge-base prototypes. It can be argued that our current approaches to database development resolutely ignore an issue that must be faced, especially as we approach the ability to store the world's information base in a relatively small physical space.

The issue articulated by Kerr White of the Rockefeller Foundation needs to be taken into account. He says:

> Libraries are repositories for information that may or may not survive the test of time and that may or may not have some ultimate practical or even theoretical value.
>
> Although a computerized information system such as MEDLARS may be suitable for certain applications, the capacity for storing, retrieving, and transmitting all possible information bearing on questions...is of trivial importance compared to the task of obtaining credible answers themselves. Where resources are in short supply they should be used for obtaining answers to important questions rather than for processing information of dubious or ephemeral value.

In other words, some value, some significant content, and some intelligence in the storage, retrieval, and display of data are essential to justify further bibliographic database development.

Early users of MEDLINE were frustrated by the long, undifferentiated lists of items regurgitated by the system until techniques for sorting and ordering output were made available. The problem for monographic retrieval is, of course, intensified by the limited number of headings and the general coarseness of their filter ability.

You may be amused by this true story. At the Library of Congress, while using the card catalog, my husband saw some kids at the SCORPIO terminals, busily typing away. Across a gulf of 40 years he regarded them benignly and envied their easy familiarity with the new technology. He thought it charming that they were helping one another out. Then he wondered why bibliographic entries seemed so entertaining. On closer surveillance he found they had discovered the latest video game: find the heading with the most postings. When he walked away the winner had found a heading with more than 37,000 postings. Then I guess they found "U.S.--History" and hit the jackpot as Henriette told us last night.

I suggest that even 10 is an overload. The rule of thumb in the health sciences is three or four "good articles." As we heard last night, the number of records in our system is awesome. It is also awesome that we seem to give the naive user no help in selecting from that mass.

The fourth expectation is for "Online files that extend every available resource to the user via communications channels, rather than requiring the user to go to the information." This, of course, in its long-range goal, is the provision of text retrieval. This capability is presently fairly limited, and in online mode is very expensive. Furthermore, present versions of online journals, textbooks, and encyclopedias are primarily replacement media. The screen provides replicas of printed pages. Words on these pages may be highlighted or underlined, but the computer is used basically as a page turner. This is the same pitfall that early CAI systems fell into and have yet to recover from.

It is likely to be a while before intelligent knowledge bases become available, partly because they are now so labor-intensive to produce, and partly because of the still limited state of the art in artificial intelligence research.

In the meantime, library systems need to respond to existing work habits and requirements of students and faculty. If they do so, they might find a broader constituency. Studies of academic libraries consistently show that a high percentage of students, somewhere between 10.8 percent and 63 percent, do not make use of library facilities. The number of part-time students and faculty is increasing. They, as well as students and faculty from professional schools, are known to register very low library use.

This is not to say that they do not read or use library materials. In fact, data show that they use libraries that are convenient, or known to have material of relevance to them. Until online text retrieval is widely available and accessible through normal academic communications channels, tools that help inquirers to browse and shop for convenient local sources of information related to their academic needs are increasingly important.

A related function is to be able to switch the user to many different files on the campus, for information or for help. Campus communication networks will most certainly need a directory of databases. Some health sciences libraries are already beginning to explore aspects of this issue. Georgetown Medical Center Library, for example, plans to use data from their strategic planning self-studies as the foundation for such a database.

Currently our bibliographic systems are broadcast messages: files aimed at the broadest audience to meet the broadest need. In building large networks that will "ultimately provide, worldwide, more information to more people than ever before about what has been published and where materials are located," a quotation from Lee Jones about a BSDP goal, we must ask ourselves whether "more" of the same is what is needed.

The trend in the media is away from broadcasting, or appealing to the greatest mass of recipients, and toward "narrowcasting," that is, special interest programming for identifiable market segments. I suspect that is what we will confront as campus communications networks evolve through "broadcasting" of what has always been in manual forms, to "narrowcasting" of what the technologies now allow us to do that had never been done before.

A last thought: I tend to think that form follows function for bibliographic architecture as well as for architectural design, because the answers to many of the thought issues Lee has given us are conditioned by the functional uses, and because we have barely begun to explore or exploit the uses of the existing generic bibliographic record by users. I hope we keep testing the product, its quality, packaging, and delivery as a way to understand the strengths and weaknesses of the structure.

## V. THE KNOWLEDGE BUSINESS: ECONOMIC ISSUES OF ACCESS TO BIBLIOGRAPHIC INFORMATION

Carlton Rochell, New York University

Ogden Nash once wrote, "Certainly there are lots of things in life that money won't buy, but it's very funny--have you ever tried to buy them without money?" Most of us have been taught that knowledge is one of those things money can't buy. But when you consider the cost of tuition, journals, books, reference materials, and the new electronic media, you realize that we do indeed buy knowledge. To some extent, we always have. And the difference today is one of cost--not kind.

There have always been those who could not afford to pay the price of knowledge. And they have traditionally turned to libraries, for one of our missions has been to provide free access to information. Today, that mission seems imperiled, for librarians are asking if we can continue to play this role in the new information age, if we can supply access not only to books and periodicals but to all the sources of information today's technology is making available--technology that we are hard-pressed to afford.

What this technology is creating is a knowledge industry. And what we must determine--and determine quickly--is just what role libraries should and can play in this industry. Or, as I would prefer to state the issue: How can we sustain our traditional role in this new environment?

It is an environment in which the most powerful players of the moment appear to be the database vendors: the public, quasi-public, and private developers of databases.

In this conference we have focused primarily on our own quasi-public bibliographic databases, those developed by library networks, OCLC, RLG, and WLN, and on the public database of the Library of Congress.

But these bibliographic databases occupy a small corner of the new world of electronic networks, in which the fastest-growing elements are commercial information services like The Source and CompuServe, government databases, and the growing number of publishers' databases and specialized services.

It is hardly surprising, since we now have a knowledge industry, that the concept of "information as a commodity" should have gained such currency.

Now, the truth is that information has always been somewhat of a commodity. Publishers have been selling it for quite a number of years. Yet we have tended to think of information as free, to allow that books were private property while their contents were somehow public property. At least we have acted that way.

But even if we think of information as "free," we are used to paying for its transmission in forms that please us or are convenient to use. That's why we buy books, magazines, and specialized journals. And already some information only exists in a form we must pay for, like the contents of certain newsletters.

The commodification of information may begin with payment for transmission in a particular format, but it doesn't end there.

As more and more information becomes available through bibliographic databases and document delivery networks, less will be available in other forms. In time, we will no longer be paying for the transmission of information. We will be paying for information itself, in the only form we can find it. And it will no longer be the specialized products of newsletters to which free access is denied.

Let's look at a concrete example of the commodification of information. Until now, all the findings of the nation's decennial census were available in print. You could get hold of the bound volumes in any federal document depository. But much of what the 1980 census uncovered exists only in computer files. It is available, all right, but there is no way to get at it except by computer--and there are damn few places where the computer time is free.

John R. U. Page has gone even further in explaining how technology will alter the economics of access to information. We now pay for the processes by which "the computer and retrieval system selects only relevant information from the total mass," says Page, and for the information itself. Moreover, Page points out, "The user is required to pay to look at it to judge its relevance." This he rightly identifies as "a relatively new commercial principle not so far applied in other sections of the information industry. For example, bookshops and bookstalls." And, I might add, it is also not applied in other industries: imagine paying for the right to look--just look at Ford's 1984 models.

As a commodity, information is unique. Information is not a private good like a car. The owner still has it even after it's sold. Neither is it a commodity that exists in limited supply. Information can be used without being used up. Forty people can pay for connect time to the New York Times databank and search for information on, say, the first moon walk, and that same information will still be available for any number of future queries.

All of this may cause us to wonder just why database vendors have established a pricing structure that tends to limit rather than expand demand. It should make us ask if the prices libraries or their users must pay for line charges or connect time are an equitable or economical way of dealing with bulk purchasers of service.

Moreover, we must recognize that if information _is_ a commodity, then it is not only a most peculiar one, but it is not a commodity alone. It is also an _entitlement_. This is how we in the library world have tended to view information. And it is not a perspective we should now consider abandoning. The idea that access to information should be governed by laws of equity and not economics certainly came through loud and clear at the White House Conference on Library and Information Services in 1979.

For us, or most of us, it remains an article of faith that people should not have to pay for access to public information.

Here let me quote a colleague of mine, who offers a particularly persuasive explanation of why the services that libraries offer are public entitlements that serve the common good--and that must remain cost-free in order to do so.

"Libraries offer goods and services that provide external benefits to society at large," Nancy Kranich writes. "If priced, these services would probably not be consumed at levels in line with the long-term public interest. In conjunction with the educational process, library services provide important collective benefits that result in increased national income, wealth, and social welfare. In addition, libraries offer the public the 'demand option' to use materials should the need arise at a particular future time. Finally, libraries offer services to poor and wealthy alike, thereby assuring access to information resources on a equitable basis."

I might also add that there has been a quantum leap in the amount of information people must have to participate fully, as consumers or producers, in our economy. And to be effective citizens today requires a fairly sophisticated understanding of science and economics, and an appreciation of other cultures.

Given the public's need for information as a tool for survival, personal achievement, and cultural enhancement, it seems obvious that information must be widely available. And to insure that it is, information is best provided on a collective basis rather than on an individual one.

I don't imagine many of you would argue with this. But if we persist in our notion of meeting today's information needs and assuring equitable access, we run squarely into the issues of cost. Who will pay for individual access to information available only via the new technology? And that means we must grapple with, but not, in my judgment, necessarily surrender to, the notion of user fees.

It can be argued--and has been--that user fees amount to double charges, since the public pays for library service through taxes and students pay through tuition.

The case has also been made that imposing user fees in libraries will impose a kind of censorship, resulting in the acquisition of only those materials or databases for which people are willing to pay. As Fay Blake has argued, "No matter what your analysis of the needs of your whole community may reveal, no matter how useful a service may be, no matter how effectively your library's resources can be organized to provide a service, the ultimate test for development of services will not be the needs of society but the ability and desire of a relatively few individual users to pay for it."

And, let me add, since the most profitable databases available are those in business and science, the databases that are in greatest jeopardy are those in the humanities and social sciences. Thus, if user fees are imposed as the norm and the marketplace prevails, the breadth of resources available will be radically curtailed.

This argument meshes well with another concern we should have about imposing user fees for electronic services, and that is the difficulty of drawing the line there. We might well be opening the door to "fee for service" libraries. If we demonstrate that one service can be self-sustaining, why not all services? Why not charge students by the number of books they use as well as the amount of time they spend online? These are questions we cannot answer philosophically. Practical answers may become equally difficult once we take it upon ourselves to break with our tradition of free access, with nominal fees--like those for late returns or interlibrary loans--charges only as a means of assuring the availability of scarce resources.

Nevertheless, there are voices today calling loudly for user fees, arguing that our commitment to equitable access is without a basis in reality. After all, libraries serve only a small part of the nation's public, and most of these users are middle- or upper-class. Libraries, they conclude, are therefore not worthy of public support--for why should the poor be taxed for a middle-class service? To them, the hottest question now seems to be not "fee or free" but "how much to charge."

Indeed, one must search diligently to find a library that has not already skewed our basic professional philosophy when it comes to database searching.

I believe it is too easy to ask "how much," and too few of us have taken the time to consider "how else." Undoubtedly, libraries must change to meet the demands of a wired world, but they can change their technology, even their methods, without changing their mission.

Libraries benefit the whole of society, directly and indirectly. Many of our nation's best writers first discovered literature inside a public library. It seems clear to me that libraries play a vital role in educating citizens, in providing them with the option to learn, and in developing citizens who can contribute to our culture.

My colleague at NYU, economist Larry White, argues that even if libraries constitute a "government service," there is no reason why they should not operate on a fee basis. He points out that, indeed, fees are levied for other government services, like toll roads or municipal parking lots.

That is indeed true. But government charges for parking space, like fees at municipal tennis courts, are meant to ration limited facilities and ones to which there are alternatives.

Many localities also charge a minimal fee for water. But what do you suppose the reaction would be if the townfolk suddenly discovered that some of their neighbors were literally dying of thirst because they could not afford to pay the local water rates. Or what if we were charged by the glass?

This is a better analogy, if a somewhat melodramatic one. And in the case of access to information, the victims who are unable to tap in because they cannot afford the fee would not even be aware of the vital resources they were being denied.

We saw what happened not long ago when the National Library of Medicine raised access fees to MEDLINE. Use by doctors fell off sharply. And I shudder to think of what this may have cost the doctors concerned, or their patients.

Of course, MEDLINE traffic picked up later when the price was lowered. But the volume of queries never returned to its earlier level.

User fees are an easy answer to a hard question, but they should not be used as an excuse for librarians to abandon their traditional commitments. Instead, let's consider how else to deal with the costs of our new information systems.

I want us to look closely at how we go about automating our libraries, what the new technology will mean in terms of acquisitions, what benefits we can expect to derive from the new systems and how we can best use them, and how we must negotiate, both within the university and outside, for a new understanding of library services and for a more substantial role within the information industry.

Consider first how management can increase the cost benefits of automation by looking at the electronic library from a more systematic perspective.

For example, there are various levels of automation within NYU's libraries. Starting at the local level, we have a computerized circulation/-reserve system, an information management system, and now an online catalog. These systems will communicate with each other through a local area network. This first-level node is connected to a regional consortium and also is directly linked to a national network--RLG. Each level operates alone and within a larger system.

In moving through these various levels, library administrators would do well to remember several points. The first, so obvious it's rarely mentioned, is to make sure their organizations are running efficiently--regardless of automation.

Second, never jump the gun. We all like to think that we're above "keeping up with the Joneses," but there is an awful lot of pressure to develop something like an online catalog when it starts to appear that "everybody has one but us." But it's unrealistic to think that we can all be at the same stage of development--and it just doesn't pay to try to implement a system you're not ready for.

Library administrators must also be wise in drawing up contracts. A good contract with a responsible vendor can be powerful insurance against the kinds of technological failure that plunge you into a financial hemorrhage and possibly unemployment!

Keep in mind that it makes economic sense to budget for technology on a capital basis, spreading the hardware and certain software costs over years and providing a means to cover depreciation.

Further, administrators must pay attention to how the new technology is being used by both staff and patrons. One of the best ways to drive down costs is to recognize when and why a system or a product isn't working effectively. If online searches are costing too much, it might mean that searchers are not using the system properly or that the system itself is not user-friendly.

For some libraries, it may be useful to set search/cost parameters. As an example, I quote James Rice, Jr.: "At Westport, librarians determine when online searching should be used in a specific situation. Then, they also determine how long it should be paid for by the library and when the patron should begin to pay. As with traditional reference work, a line is drawn with each patron as to how much individual service is justified or warranted. At Westport, this is usually a half hour of online searching or traditional reference assistance. The time limit is a guideline, not a rigid rule. The initial inquiry is free and librarians at Westport anticipate that most information needs can be met within the allotted time."

While I don't agree with this model in all of its particulars, especially its pricing structure, the basic concept is sound--as long as librarians must remain gatekeepers, we must be able to determine when online searching is mandatory and when it is unnecessary.

One of the major problems you must address when dealing with online services is choosing those database rate structures that are most cost-effective. As Harry Kibirige points out, this may require coordination of discrete units. Kibirige writes, "In some organizations utilizing services from commercial databanks, the central administration may purchase data communications services from Telenet, the technical library may use AT&T and the medical center may use Tymnet when accessing the same data banks....In such a situation," Kibirige concludes, "wastage of funds can be avoided by initiating a central data communications policy and minimizing the number of data communications vendors."

Finally, library administrators must seek support for automation from as many sources as possible. They must look to their local, state, and federal government, and to foundations. And, most importantly, they must be able to document their case to their own funding authorities: that their institution and the new technology it employs will provide concrete benefits to the community it serves. This means investing in grant campaigns and in lobbying.

For those who may doubt the effectiveness of lobbying, let me cite an example provided by Fay Blake: A few years ago, Jerry Brown--then Governor of California--showed up unexpectedly at a California Library Association Conference. "A University of California librarian brought to his attention the growing problem of fees for services, got his quick acknowledgement that this sounded elitist and undemocratic and his agreement to consider legislation for alternatives. Before the day was out, a proposal was in the works for the preparation of such legislation. An amendment to the California Library Services Act is under consideration providing for a state-owned online database service that would provide to public and academic libraries and to state agencies the most frequently used databases at a minimum charge." Now, of course, most lobbying activities do not have such immediate payoff, but they pay off in the long run.

One last point on this subject. Library administrators should remember that their greatest advocates can be--and should be--the users themselves. When the public in general and the university community in particular become convinced they need new and better services, and demand them as their right, half of our battle will be over.

Let's assume that we have all been wise and diligent and first-rate grantsmen or grantswomen--and we all have automated libraries. One of our first concerns should be the acquisitions policies appropriate to a network environment. As many of us already know, libraries need to re-orient themselves to a world in which collecting information is of less concern than transmitting and providing access to it.

At the IFLA conference held this summer, Maurice Line, Director General of the British Library Lending Division, explained this notion: "...more and more information will be transmitted but not recorded," he began. "Secondly, the recording of information will no longer be in the fixed forms to which we have been accustomed--the printed page, the gramophone disc, the film--because electronic stores are amenable to change. Our attitudes to national archives of recorded knowledge will have to change; and if libraries are not to have a diminishing role as information communicators, they will have to devote less attention to storage and more to transmission." He adds, almost as an aside, "It will take us some time to adjust to the concept of recorded information as fluid and changeable."

Now, how does this new concept of information change our collecting policies? First, we should try to offset the price of supporting technology by canceling expensive subscriptions to rarely used and duplicative print indexes and services. What this means is that a library doesn't have to pay up front for an index that may be used once in a year, but only for the cost of that one specific online query. Another consequence of this new orientation to collection development may be that libraries will have to stop buying in areas that are rarely used.

Lest anyone jump to the conclusion that I am urging libraries to abandon their archival function, let me add that I would like to see the archival function carried out collectively. For example, first RLG libraries and now ARL libraries are conducting conspectus projects to compile a comprehensive, subject-based assessment of their members' existing collections and collecting practices. The projects' aim is to make each library responsible for certain areas of strength. The philosophical underpinning is simple and sound: In today's world, access--and not ownership--of information is all.

Acquisitions is not the only area where library automation will produce net gains. The old adage "time is money" is still true, and technology saves both time and money by opening up new and more efficient lines of communication between internal departments and among various libraries.

Automated libraries are also less labor-intensive than libraries of the past. At first we will only be saving hours, freeing staff from one chore only to occupy them with another. But eventually we will be able to actually reduce the size of our support staffs. The online catalog, for example, will eventually eliminate the need for clerks to file cards. It will also reduce the number of staff needed to determine whether an item has been checked out or if it has been ordered--that information will be readily available online.

Until now, technology has saved us money in the "back room," but as the volume of independent users grows there will be less demand for professional intervention, and thus we'll be saving in the "front room" as well. But to realize these savings out front, we will need systems that are truly user-friendly.

In time, many patrons will be able to address reference queries directly to the online catalog or to terminals dedicated to bibliographic and other databases from scholar work stations. In most cases, online searching will be more flexible and comprehensive than manual searching. And let me remind those who think users will find electronic searches too complicated and time-consuming that many patrons are now overwhelmed by the enormous task of tracking down the appropriate print texts, deciphering their symbols and instructions, and weeding out just the right facts. For them, online searching may well prove a blessing.

In fact, almost all the questions we are getting on Bobst's online catalog--BOBCAT--are: "When will we get more records, more features? When will we get terminals in other locations?" No one says "Let's go back to the card catalog."

By carefully managing our organizations as technology is applied, we should see savings in personnel costs--savings that could be applied, for example, to an annual charge for database searching and other new information services. What this boils down to is using the benefits of technology to pay for technology.

We should be able, if we are wise and diligent, to automate our libraries with a minimum number of costly mistakes and the maximum amount of outside support. We should be able to realize some savings on the trade-off of access for acquisitions and achieve a few economies in personnel as well.

Will all of this allow us to duck the question of user fees? Of course it won't.

I believe there are two answers to this question. The first, and more immediate, is to recognize that simply passing on access charges to students and faculty, while it may seem the easiest solution, is not the best.

Instead, I propose that we pass on the problem rather than pass on the bill. We do not determine how many books are needed by students of economics or English or advertising or law. The faculty determines that. The schools and colleges pretty much determine the level of services they expect from the library and, in theory, they cover the costs of these services by taxing their students.

Is it really so different when databases replace books and journals? Cannot the schools, colleges, and departments, working with the library, establish guidelines and set standards of access, and cover the costs as they have always covered library costs--through tuition or state appropriations?

The alternative, charging everyone for every service, is neither cost-efficient nor consistent with our basic philosophy. I believe we are in a good position to make our case. For years, I have argued that online services should be an integral part of a library's reference department, and with good results. Recently, NYU's Vice President for Finance came to realize that, philosophically, computer services--including those offered by the library--

are now an essential educational service for the university and that students should no longer pay directly each time such services are needed. Philosophically, at least, the point has been made.

But there is a second answer to the question of costs. It lies in the uses that we will make of our new systems and the role our libraries can play in the knowledge industry, ways in which we may offset the costs of technology, not by what we save on our old operations, but by what we earn on some of our new ones.

Now, most studies demonstrate that academic libraries are one of the biggest customers of commercial databases. If this is the case, then we should be using our clout to convince database vendors to price their services to libraries at flat or discount subscription rates rather than on a connect-hour basis.

If vendors would take this first step, everyone--libraries, researchers, and vendors alike--would benefit. Lower fees would translate into greater volume. Jan Egeland of BRS has no argument with this. "It is preferable from our point of view," Egeland says, "to have a smaller return from a larger number of connect hours, than to rely on high return from a limited percentage of the total potential searching volume."

Vendors also can be a source of additional revenue, for there is a flip side to the library-vendor relationship. Richard Phillips Palmer writes: "For some of the services that they render, information services rely on libraries. They turn to libraries when they are engaged in research, document delivery, information-on-demand, and consulting services." According to Palmer, "Over half of the fee-based information services in this country belong to the Special Libraries Association in order to gain access to libraries. Many state that user charges would not be a deterrent to their use of libraries."

It was the business side of libraries that drew the greatest attention at a conference on library budget problems held at C.W. Post last June. The most important contribution of the conference, in my opinion, was its emphasis on academic libraries assuming an active role in the information industry, and having off-campus users pay for information.

This holds true when we talk not only of database developers and information brokers, but also of corporations who tap into databases of special libraries, like NYU's Graduate Business Library or Real Estate Institute. If information is all in this wired world, a concept now popular in the corporate world, businesses must be willing to pay the price--and they are.

In short, when dealing with those who recognize and treat information as a commodity, and who use it for profit, libraries must be prepared to do the same. It seems foolhardy to give information at bargain rates to those prepared to pay dearly for it, and then to whine that we have no choice but to demand direct payment from students and scholars.

Let's take the notion of the library's business side a bit further. If libraries are bold enough, they can do more than negotiate subscription rates from vendors or charge information brokers for library services. They can become better retailers of information. Leasing database services at subscription or discount rates, libraries could then offer search services to off-campus clients with no other access. This retailing would pose no more threat to database vendors than traditional library operations have posed to conventional publishers. Furthermore, it would secure for libraries a vital, and appropriate, role in the knowledge industry.

As a great many speakers at the C. W. Post conference agreed, the external marketing of online services may be the best way to solve the financial crises of academic libraries--and to preserve the public's right to equitable access.

If we take the initiative and develop the capacity of our own information services and actively solicit more commercial users through aggressive marketing, we may see the library move naturally and effectively onto and over the ninth wave into the new information age.

If we are going to get this transition under way, then we have got to start by coming to some kind of agreement with database producers and database vendors.

It's all very well to speculate about why we should get flat subscription rates, and what we could do with them if we had them, but we are not going to get them by complaining about how unfair the present system is, or by special pleading that we are such worthwhile institutions, serving in so many ways.

We have a chance to get what we want, or part of it, if we get together and flex some collective muscle. We know how much of their services we use. We know how much they depend on our resources. We must make sure that they know we know it, and that we are not prepared to sit passively by and see vendors fatten while we are forced to impose user fees.

What concerns me right now is how vital are the decisions we will be making in the next few years. Technology is here for the long run. There is no turning back or holding off. If libraries are going to survive, they will have to automate. And library administrators will have to hone their management and fund-raising skills.

To support the costs of automating, libraries will have to use local and national networks to the fullest and to protect the notion that those networks and utilities that we have created, or helped to create, operate within an economic scheme that recognizes our philosophy. They will also have to develop the "corporate connection." This may mean charging information brokers and retailing database services to other off-campus users. A rational economic structure may also include ventures with either hardware or software firms, as well as involvement in the videotext market, new technologies, and markets not yet developed.

All that these suggestions change are the ways in which we support and manage libraries, not their mission. We must assume a more active role in the knowledge industry as a means to preserve the entitlement to information, to assure that free access is a living reality and not a dead ideal.

# VI. RECOMMENDATIONS OF THE WORKING GROUPS

The four working groups met Thursday afternoon to discuss the issues raised by the morning's challenge papers and the previously distributed list of questions.

Each group was led by one of the morning's speakers with the exception of Group D, where James Govan served in place of Carlton Rochell, who had to return to New York after his presentation that morning.

Two groups responded to specific questions; two groups prepared a set of recommendations. The reports were given as the first order of business on Friday morning, December 16.

## Report from Group A

Douglas Ferguson reported that the group's highest-ranking recommendation was the interfacing or linking of the bibliographic utilities; to that end, the group called for a careful examination of the protocols currently being developed.

The "wired campus" concept is an area where libraries should take a leadership role, he said. Academic research libraries should convince university administrations of the need to create such systems, with library personnel willing to assume leadership roles.

Ferguson reported that the status of automated content analysis should be assessed, with the premise that records could be expanded on a pragmatic basis.

Finally, the allocation of resources in response to adopting new technologies needs to be examined to make sure the requirements of users continue to be met. New patterns of resource allocation should be introduced for collections, staffing, and facilities, including new technologies, Ferguson said.

The members of Group A were Douglas Ferguson (discussion leader), Larry Besant, Rowland Brown, Martin Cummings, Nancy Eaton, Carol Ishimoto, Lynn Magrath, Ronald Miller, and Keith Russell.

## Report from Group B

Group B responded to specific questions. Sarah Thomas reported their recommendations:

ARE STUDENTS AND SCHOLARS WELL SERVED BY THE PRESENT BIBLIOGRAPHIC STRUCTURE? Despite great strides made in increasing bibliographic access, further advances are called for: A) the need to ensure that access to documents keeps up with the bibliographic system, and B) that the scholarly community be given an opportunity to articulate its bibliographic needs and concerns, rather than relying on bibliographic system designers, vendors, or utilities to make the right assumptions. For this, librarians should educate scholars so they can voice their needs within the context of new technology.

Further, librarians should conduct a series of studies to provide data on user populations and use of particular systems, while focusing on quality of service and not on quantity alone.

ARE THERE PRODUCTS WHICH SHOULD OR OUGHT TO BE DEVELOPED FROM EXISTING BIBLIOGRAPHIC DATABASES? Foremost should be the development of products to enhance a library's ability to manage its collection locally, such as subject bibliographies used for cooperative collection development. Also, such bibliographies would be time-saving to potential users such as scholars planning to visit an institution.

Additionally, the development of downloading on microprocessors would enable scholars to create their own customized subsets of information.

WHAT ARE THE SHORT-TERM NEEDS OF USERS AS THEY RELATE TO BIBLIOGRAPHIC RECORDS AND SYSTEMS? ARE THEIR LONGER-TERM NEEDS DIFFERENT? HOW? Short-term needs: Of prime importance is strong support for rapid standardization of links between bibliographic systems. Next is a system that tells users what is available in their libraries, including location and status.

Longer-term needs: First, the development of cooperative programs for all research libraries, such as RLG's shared collection management and development, shared resources, and preservation programs. It is important to identify collection gaps, particularly in light of the declining rate of monograph acquisitions at most institutions. Connected with that would be the establishment of a means of quality control in building quality collections.

Finally, libraries should be a cohesive force in the intellectual process, using, for example, electronic mail to provide access to the "invisible college" and drawing up "maps" showing where information is available.

WHAT ARE THE BARRIERS TO UNIMPEDED ACCESS TO BIBLIOGRAPHIC RECORDS? HOW CAN THEY BE BREACHED? Libraries should espouse the principle that access to information about the existence of material and its location, through bibliographic data, is an inalienable right. To deny this is intellectually indefensible.

WHAT WILL THE BIBLIOGRAPHIC REQUIREMENTS BE AT THE TURN OF THE CENTURY? First, full text availability. Second, the ability to allow the user to enhance the bibliographic record through the addition of information. Third, in light of changes in the publishing process, such as increased use of non-traditional publications, a different kind of library professional will be needed: if not the equivalent of the teaching faculty, then one who is well-integrated into the academic community and able to evaluate scholarly contributions.

HOW WILL INSTITUTIONS DEAL WITH INCREASED COSTS REQUIRED TO IMPLEMENT ADDITIONAL BIBLIOGRAPHIC SERVICES? First, a cautionary note: Before embarking on a new system, the entire structure and possible tradeoffs should be closely examined, since the resources for maintenance of existing systems may compete with resources to develop new systems.

Second, library directors must be fundraisers. Third, the definition of core services should be expanded to include automated services, so that funding requirements are obvious. Additionally, libraries should determine whether staff savings through automation may cover increased costs. Finally, libraries should consider marketing services to secondary groups of users, such as the business community and alumni.

WHAT ARE THE PROBLEMS OF INTEGRATING THE ONLINE CATALOG INTO THE "WIRED CAMPUS"? Such connections might degrade response time through competition for limited resources. Also, there are potential problems in communication between the campus computer center and the library, and in questions of authority over the operating system. Therefore, the group recommended caution in taking such steps, and the preparation of guidelines for libraries entering this phase of development, including training needs and staff support.

The members of Group B were Thomas Martin (discussion leader), Henriette Avram, Abraham Bookstein, Charles Churchwell, Frank Grisham, Warren J. Haas, Roderick Swartz, and Sarah Thomas.

## Report from Group C

Group C also made its recommendations on an issue-by-issue basis. Patricia Molholt reported.

The group noted that there "appears to be a series of concentric circles of user need levels," where the first circle is what constitutes the ideal, immediately accessible local catalog and its user needs; the second and succeeding rings consist of as yet undetermined user needs. The group recommended that the Council begin studies to identify these user need levels.

CAN ONLINE SEARCHING BE SIMPLIFIED? HOW? It is considered to be too early in the development of the online catalog to have wide-scale standardization, and simplification as such is not yet necessary. To avoid too much diversity, however, the Council should play a role in educating catalog designers about options and effectiveness of systems. The development of guidelines for compatibility of automated catalogs and other systems is a longer-term need.

WHAT ARE THE PROBLEMS OF INTEGRATING THE ONLINE CATALOG INTO THE "WIRED CAMPUS"? There is frequently a disjuncture between campus-wide information or communications problems and the library's role in formulating solutions. Therefore the group encouraged the Council to join with EDUCOM to identify the issues in this area, and to assist university administrators in focusing on the importance of the library's role in solving such problems.

One result may be a publication similar to EDUCOM's book on strategic planning for computer services.

HOW WILL THE LIBRARY DEAL WITH ACCESS PROBLEMS EXPERIENCED BY REMOTE USERS OF ONLINE CATALOGS? Libraries can and should handle access problems by offering courses similar to those offered by computer centers on the use of automated library services, by establishing a "helpline," and by including help and tutorial programs within their online catalogs.

HOW WILL INSTITUTIONS DEAL WITH INCREASED COSTS REQUIRED TO IMPLEMENT ADDITIONAL BIBLIOGRAPHIC SERVICES? Again the group recommended that the Council join with EDUCOM to encourage a reevaluation of institutional resource allocation, with the aim of partially accommodating the growing costs of library automation.

The library needs to reorganize priorities for its own resources in light of automation, but the group was fearful of any approaches calling for staff reductions in the near and mid-term future.

IS THE PRESENT RECORD STRUCTURE ADEQUATE? The group called for the Council to explore methods of increasing bibliographic access available as a result of electronic publishing. Specific areas to be examined would be the value of providing tables of contents, indexes, etc.

The members of Group C were Nina Matheson (discussion leader), David Bishop, Lee Jones, Richard McCoy, Patricia Molholt, Basil Stuart-Stubbs, and Frederick Wagman.

## Report from Group D

Group D was represented by John McCredie, who reported their overall recommendations.

A great barrier to access, he said, is the cost and pricing structure of bibliographic activities. The problem is how to allocate resources to pay for computing costs, especially when those resources are scarce. Where the Council could help is in examining or creating models of library resource allocation or reallocation, perhaps with the assistance of EDUCOM.

The current library models are nebulous; new models could be brought forth. Such models should include A) the reallocation of funds within the library system and B) the reallocation of funds within the total organization, such as a university-wide model incorporating all information activities, he said.

The group also called for the Council to help in finding new resources outside of those currently available. This may entail combining all information groups in a cooperative program, beginning with library and computer people. In conjunction with that is the need to develop reliable industrial support. IBM, for example, is a logical organization to approach, judging by its track record, but it needs to be educated about libraries.

The "micro revolution" is changing the information world, he concluded, and new sources and patterns of funding should be incorporated into new models.

The members of Group D were James Govan (discussion leader), Michael Buckland, Kaye Gapen, Marcella Grendler, John McCredie, and Paul Peterson.

## VII. PRIORITIES SET BY THE CONFERENCE

Following the reports of the working groups, Lee Jones led the discussion that culminated in a list of priorities to guide the Council in shaping future activities for the BSDP.

He pointed to "threads of commonality" among the group reports, especially in two topics mentioned repeatedly: A) the reallocation of resources combined with the development of new resources, and B) the linking of the bibliographic utilities and systems.

The ensuing discussion brought out several other recommendations:

- that the development of the wired campus be a high-ranking priority
- that subject access be assessed and improved, along with other levels of access
- that scholars and users be involved actively in designing information systems
- that the "Memex" system of scholarly work stations first proposed by Vannevar Bush in the 1940s be reexamined, along with other methods of introducing technology to scholars
- that the Council concentrate more on bringing together those groups who could bring these steps about
- that the Council expand its role in disseminating information about these activities.

This in turn led to a final list of priorities, ranked in the following manner:

1. Pervasive Priorities
    A. Linking of the bibliographic utilities and their resources
    B. More communication, especially by the Council, interpreting bibliographic developments

C. The reallocation of resources

2. The Wired Campus

   A. Planning for the wired campus

   B. Evaluation of models for the integration of all campus information systems

   C. The reallocation of resources for the implementation of the organization-wide system

   D. The development of new resources

3. Increased User Involvement and Access

   A. Greater involvement of scholars and other users in finding solutions to access problems

   B. Assessment of the value and benefits of libraries in the electronic environment

   C. Equality of access: unimpeded access to both information and bibliographic information

   D. Memex II: restudying the scholarly work station in light of new technology and systems

4. Increased Bibliographic Access

   A. Improvements in subject access and the assessment of automated content analysis

   B. Multiple levels of access to databases

   C. Guidelines for the compatibility of online catalogs

   D. More effort to provide both bibliographic access and delivery of source documents

Lee Jones said that the list set forth clear-cut ideas for the Council, and that the next step would be to determine how best to capitalize upon these activites.

## Adjourning the Conference

To sum up, Jones asked each participant for comments on the conference. A number of people called the conference smoothly run, or as Frederick Wagman said, "well laid on." Many remarked that it was beneficial to have such an interaction of diverse people, especially in the smaller groups. Several participants reiterated that the Council should publish more.

Jim Haas noted that as of this conference, more than 500 people had been involved in fulfilling the goals of the BSDP.

The meeting broke off; the participants disbanded; the conference ended. The people who had come together to share, plan, and carry out mutual interests now departed, some into smaller groups for yet one more meeting, to share a ride back to the airport, to talk about what they had just talked about. Some left singly, to relax, to muse, or just to go home.

All, it may be said, had had an opportunity to contribute to the future of the Bibliographic Service Development Program, and thus to the future of information.

# APPENDICES

# APPENDIX A

## FIVE YEARS OF THE BIBLIOGRAPHIC SERVICE DEVELOPMENT PROGRAM: 1979 - 1983

by C. Lee Jones

This paper is an effort to characterize work carried out over the last five years in CLR-funded grants and contracts in the area of bibliographic services. Included are the results of work done by hundreds of individuals, both as consultants to CLR and in their own professional capacities. This statement provides a backdrop for other, more detailed program and progress reports by considering the change that has taken place in the bibliographic structure of the nation during the last five years and by characterizing, year by year, the Council's Bibliographic Service Development Program, which has been one of the primary forces in bringing change.

Because it concentrates on issues of importance to libraries and their users (rather than on the personal or institutional concerns that dominate other professional or library organizations), it was appropriate to base a major cooperative bibliographic effort at the Council. With funding from seven private foundations and NEH, work actually began in early 1979. While initial estimates indicated that program objectives would be met in five years, the complexity of the work to be done, a shortage of skilled individuals available in the key institutions, and a gradually expanding agenda have combined to extend the time frame by perhaps two years. The initial estimated cost of $6.2 million continues to appear sound.

The environment into which the BSDP was born included three domestic organizations competing for the shared cataloging business of the nation's libraries. OCLC Online Computer Library Center was attempting to enlist all types of libraries, WLN (Washington Library Network) to win the business of libraries in the northwest, and RLG (Research Libraries Group) to attract the allegiance of the larger research libraries. To say there was conflict among them is to understate the circumstance. The Library of Congress with its Network Development Office was trying to define and encourage the development of a true national network of libraries. OCLC was certain that it could and would become the de facto national network. RLG needed to survive in order to achieve its programmatic goals, and viewed the shared cataloging service over which it could maintain operational control as critical to its continued survival and appeal to research libraries that had not yet joined. This put RLG and OCLC in a classic market battle that is not yet over.

In 1979, the principal concern of libraries in this arena was limited to shared cataloging, although some were looking forward to other possible services. Acquisitions systems were under development by all three shared cataloging services and a number of other institutions and organizations as well. Computer-assisted interlibrary loan services became important as soon as they were offered, first by OCLC, then RLG and WLN. Not long after interlibrary loan services achieved such marked success, online catalogs became increasingly important to libraries. The year 1981 marked the beginning of a substantial effort on the part of the BSDP to help evaluate and establish some benchmarks for the design of online catalogs.

Though the BSDP has been concerned with linking databases from the beginning, only within the last six months or so has the value of linking disparate systems become widely appreciated by the library community. It is likely that once operational links exist among the larger systems, smaller systems will take advantage of the work done and create operational links with many other organizations.

Through all of these years of shared cataloging, acquisitions, interlibrary loan, online catalogs, and the distributed process concept that leads to thoughts of widespread linking, there has been a continuing spirit of competition, occasional mistrust, and perhaps even some intrigue among OCLC, RLG, and WLN. Many of these conditions remain today, though there have always been signs of cooperative activity between RLG and WLN and from time to time between OCLC and WLN and even between OCLC and RLG. All three are eager to cooperate with the Library of Congress and do so with varying degrees of success. In fact, if the Library of Congress had ever been mandated and funded to be a true "National Library," it is unlikely that a BSDP would have been necessary. The funding programs that were and continue to be required would have logically come from LC. But the mandate is assumed and not delegated or funded. Hence, the Council's Bibliographic Service Development Program.

Probably one of the most important and earliest acts of the BSDP was the formation of a Program Committee that included the chief executive officer of each of the shared cataloging services. Each accepted the invitation to serve and all continue to this day. The early meetings were the only setting they had in which to get to know one another. To the extent that progress has been made in encouraging them to work cooperatively, one must assume that opportunities to meet, talk with, and understand one another have had some influence.

The nature of BSDP program interests has changed over time. While the fundamental concern of the BSDP has always been for the needs of library users, the first funding concerns were those focused on systems and linkages between them. As progress became apparent in these areas, the emphasis shifted to concerns directly related to services provided to library users. This shift can most easily be detected in an examination of program funding commitments as measured by grants and contracts made in each of the five years.

The year 1979 was the first year in which grants or contracts were awarded, and nearly all funds committed during that year were allocated to strengthening primary databases (LC's Name Authority File) and beginning the examination of ways to link the very large databases: LC, OCLC, RLIN (RLG's Research Library Information Network), and WLN.

In 1980, more than a quarter of committed funds were for continued work on the linking problem, but, rather than attempting to establish the strategy for linking, work was now funded to test an identified strategy. Over 40 percent of program commitments were allocated for the development of systems for exchanging authority records. BSDP commitments also were made for analyzing and improving access to bibliographic databases, regional and special. Most of the remaining funds (over 15 percent) went to support an early examination of the state of online catalogs and for plans to evaluate those already in operation.

In 1981, the work of the first two years culminated in the largest single-year commitment of funds for BSDP purposes: $1,824,643. Nearly half went for the linking of LC, RLG, and WLN and the creation of a means to build and share a national name authority file. Just over a third of the 1981 commitment was used for a broad-based evaluation of online catalogs and their effects on users. A minuscule one-tenth of one percent was awarded for a very significant study of subject access problems and opportunities--a study that would have an impact far broader than its costs.

In 1982, while total grant and contract commitments shrank more than 44 percent to $1,016,898, a substantial number of library institutions in this country were busy working on BSDP projects funded in 1981. The overwhelming majority of funds granted in 1982, over 88 percent, continued to be for projects leading to links between the authority systems of the three large databases. But important commitments were made to develop ways to incorporate machine-readable texts in the humanities into the bibliographic structure of the country, and to develop software for individual scholars and students to capture, retain, and subsequently use information from the large bibliographic databases. A substantial commitment was also made to examine the costs associated with online catalogs.

So far in the current year, total dollar commitments are lower than in any year of the program and more balanced across various program interests. Just over 14 percent has been allocated to standards activity, 8 percent to access to bibliographic data, 7 percent to linking databases, 26 percent to subject authority/subject access, 7 percent to bibliographic products and services, 21 percent to CONSER, and 16 percent to user guidance and training.

Some program categories have received funding attention in each of the five years of the program, for instance, standards and guides, linking bibliographic databases, and name authority projects. Access to bibliographic data, bibliographic products and services (most often online catalogs), and subject authority/subject access have received funds in each of the last four years, while CONSER is a program interest that has received attention in each of the last three years. The subject authority/subject access area is expected to continue to be the focus of much attention in the next year or two, underscoring the move of BSDP interests to the user end of the spectrum.

Commitments in the area of standards and guides have been modest but steady, recognizing the need to continue to encourage the establishment and use of standards in the development of a nationwide activity in the international environment, since the ultimate long-range goal is a worldwide bibliographic system.

In contrast to 1979, the bibliographic structure of the country is now much further developed. Of progress related to the BSDP, not all that has happened is related solely to grants and contracts. Much progress can also be traced to program-supported conferences. Over the course of the last five years, the BSDP has convened seven carefully targeted meetings. Topics have included linking, authorities, online catalogs, subject access, costs of online catalogs, training users of online catalogs, and online catalog design. Two more conferences are presently scheduled, with several others in various stages of development. In addition, there have been many less formal meetings convened by the BSDP on an even wider range of topics.

By early 1984, the bibliographic structure of the U.S. will still include the three major shared cataloging services, two of which will have implemented online links to the Library of Congress and with each other. Authority records will be flowing over the links, and explorations of other applications that might take advantage of the link will be well advanced. The era of the integrated library system will be closer at hand, yet still not quite close enough to satisfy the more harsh evaluators. (An integrated library system can be defined as a set of library functions, using a common or shared database, to achieve the operational goals of the library.) The era of distributed processing, that is, processing responsibilities passed from a central locus to remote computer/microcomputer sites, will be closer as well. This will lead to a reduction in telecommunication connect time, if not actual costs, by reducing the amount of interactive activity required between central and remote sites, reduction of load on the central site, and retention of local control for certain functions, e.g., serial check-in and circulation.

There are now more organizations selling library system software as either complete, integrated systems (Virginia Polytechnic Institute system) or as partial library support systems (Northwestern's NOTIS, Washington Library Network's system sold by Biblio-Techniques as BLIS, and many others). Each of these systems will need to evaluate how useful the telecommunication protocols being developed, implemented, and tested in the Linked Systems Project might be for their purposes. It is likely that the BSDP will be involved in such evaluations.

There are probably more than 300 libraries of all kinds that now have online catalogs, and many others that are planning for them or actively evaluating the many online catalog options on the market. While the first online catalogs were frequently offshoots of circulation systems, libraries now shop for online catalogs that will also support circulation systems. It is likely that as interinstitutional cooperation begins to be a matter of routine operation, these systems will be required to access others for purposes of bibliographic identification and ordering (interlibrary loan or purchase).

The library bibliographic world has changed in the last five years and the BSDP has been a part of many of those changes. The challenge is to continue to be effective in helping meet the generic bibliographic problems of academic and research libraries. In preparation for meeting that challenge, a meeting of 35 individuals, none of whom, except for certain members of the BSDP Program Committee, have ever received a BSDP grant or contract, have been invited to a meeting in Kansas City in mid-December to help identify the future course of the BSDP. It will be a matter of choosing from among a large number of things to be done, those that need immediate attention and are most susceptible to solution with limited resources in the next two years.

The foundations, in addition to the National Endowment for the Humanities, providing support for the Council's Bibliographic Service Development Program are:

1. Carnegie Corporation of New York
2. Commonwealth Fund
3. Ford Foundation
4. William and Flora Hewlett Foundation
5. Lilly Endowment, Inc.
6. Andrew W. Mellon Foundation
7. Alfred P. Sloan Foundation

December 1983

# APPENDIX B

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LASP-13 "Characteristics of current authority data files/LASP." October 31, 1980. Characteristics of WLN, RLG and LC current files: size and growth rate, data elements, and standards used. An appendix, Field Usage Tables, compares usage of data elements by WLN current system, RLG/NYPL current system, RLG/NYPL prospective system, and LC current system. 6 pp. plus appendices.

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LASP-25 "LASP functional specifications: intersystem component." March 31, 1981. Functional specifications for the interactive intersystem searching, message exchange, and on-demand record distribution facilities for the project. 37 pp.

LASP-26a "Task list and associated Gantt charts/LASP." March 13, 1981. A list of tasks and products for the Telecommunications and Authorities groups, along with an indication of working periods and completion dates. The Gantt charts provide a graphic representation of Authority group project activity. These documents will be updated periodically.

LASP-26b "Task list and associated Gantt charts: Authorities group/LASP." March 31, 1981. Differs from LASP-26a in that Telecommunications group activities are not included on the task list. 6 pp.

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December 1983

## APPENDIX C

## AGENDA

BIBLIOGRAPHIC SERVICES AND USER NEEDS

A Conference Sponsored
by the

Council on Library Resources'
Bibliographic Service Development Program

Convened at Linda Hall Library
5109 Cherry Street
Kansas City, Missouri 64110

December 14-16, 1983

### WEDNESDAY, DECEMBER 14, 1983

ALAMEDA PLAZA HOTEL
(across the street from the Raphael)

| | |
|---|---|
| 6:00 - 6:45 p.m. | Board Room #2<br>Cocktails |
| 6:45 - 8:00 p.m. | Board Room #3<br>Supper |
| 8:00 - 8:15 p.m. | Welcome and Introductions |
| 8:15 - 9:15 p.m. | Bibliographic Services: A Five Year Review |

### THURSDAY, DECEMBER 15, 1983

LINDA HALL LIBRARY
5109 Cherry Street

| | |
|---|---|
| 9:00 - 9:30 a.m. | THE ACADEMIC COMMUNITY<br>AND BIBLIOGRAPHIC SERVICES<br>Thomas Martin<br>Syracuse University |
| 9:30 - 9:45 a.m. | Discussion |

| | |
|---|---|
| 9:45 - 10:15 a.m. | BIBLIOGRAPHIC ACCESS:<br>PROBLEMS AND PROSPECTS<br>Douglas Ferguson<br>Stanford University |
| 10:15 - 10:30 a.m. | Discussion |
| 10:30 - 10:45 a.m. | COFFEE |
| 10:45 - 11:15 a.m. | INTEGRATED ACADEMIC INFORMATION<br>SYSTEMS: THE BIBLIOGRAPHIC INTERFACE<br>Nina Matheson<br>National Library of Medicine |
| 11:15 - 11:30 a.m. | Discussion |
| 11:30 - 12:00 noon | ECONOMIC ISSUES OF ACCESS<br>TO BIBLIOGRAPHIC INFORMATION<br>Carlton Rochell<br>New York University |
| 12:00 - 12:15 p.m. | Discussion |
| 12:30 - 1:30 p.m. | LUNCH |
| 1:30 - 3:00 p.m. | Four Discussion Groups<br>(Each led by one of the<br>morning speakers) |
| 3:00 - 3:30 p.m. | COFFEE |
| 3:30 - 5:00 p.m. | Continue Discussion Groups |
| 5:00 - 5:45 p.m. | TOUR OF LINDA HALL LIBRARY |
| 6:15 - 7:00 p.m. | Cocktails - Linda Hall |
| 7:00 - 8:15 p.m. | SUPPER with Linda Hall<br>Board of Trustees |
| 8:15 - 8:45 p.m. | IMAGES OF BAROQUE SCIENCE:<br>Some Title Page Themes with Variations<br>William Ashworth<br>Linda Hall Library |

## FRIDAY, DECEMBER 16, 1983

LINDA HALL LIBRARY
5109 Cherry Street

| | |
|---|---|
| 9:00 - 10:00 a.m. | Discussion Group Reports |
| 10:00 - 10:15 a.m. | COFFEE |
| 10:15 - 11:00 a.m. | Recommendations and Priorities |
| 11:00 - 12:00 noon | Participants' Reactions<br>Adjournment |

## APPENDIX D

## LIST OF PARTICIPANTS

BIBLIOGRAPHIC SERVICES AND USER NEEDS

A Conference Sponsored
by the

Council on Library Resources'
Bibliographic Service Development Program

Convened at Linda Hall Library
Kansas City, Missouri
December 14-16, 1983

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